

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing
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Applicant's or agent's file reference

200168.00001

IMPORTANT NOTIFICATION

International application No.

PCT/US03/32703

International filing date (day/month/year)

16 October 2003 (16.10.2003)

Priority date (day/month/year)

16 October 2002 (16.10.2002)

Applicant

TRANSPORT SYSTEMS INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US

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Form PCT/IPEA/416 (July 1992)

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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 200168.00001	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/32703	International filing date (day/month/year) 16 October 2003 (16.10.2003)	Priority date (day/month/year) 16 October 2002 (16.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): B 61 B 12/02, 13/04; E 01 B 25/22 and US Cl.: 104/96, 106, 107, 108, 118, 119; 105/141, 144		
Applicant TRANSPORT SYSTEMS INC.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>7</u> sheets.</p> <p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input checked="" type="checkbox"/> Certain defects in the international application</p> <p>VIII <input checked="" type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand 12 May 2004 (12.05.2004)	Date of completion of this report 02 August 2004 (02.08.2004)	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer <i>S. Joseph Morano</i> S. Joseph Morano Telephone No. (703) 308-1113	

Form PCT/IPEA/409 (cover sheet), July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US03/32703

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description:
pages 1-12 as originally filed
pages none, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the claims:
pages 13-17 and 27 as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages 18-26, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the drawings:
pages 1-9 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>1-68</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-68</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-68</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-68 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a sortation system comprised of a monolithic monorail track, a plurality of interconnected cars and a plurality of wheel assemblies on the cars, a drive car in the plurality of interconnected cars, a wireless control signal receiver and a control signal transmission device.

----- NEW CITATIONS -----

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VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

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VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claims 1 and 39 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 1 is indefinite for the following reason(s): The use of the trademarked product CAN bus network. A generic term should be used.

20. The sortation system according to claim 2, wherein each car includes a plurality of wheel assemblies, each wheel assembly engaging the track, each wheel assembly comprising:

a plurality of spaced apart side wheels; and
at least one end wheel, the at least one end wheel rotating about a horizontal axis.

21. A sortation system comprising:

a longitudinally extending monolithic monorail track comprising:

an upper wheel engaging section;

a lower wheel engaging section; and

a power section, the upper wheel engaging section being connected to an upper portion of the power section and the lower wheel engaging section being connected to a lower portion of the power section;

a multi-conductor power bus mounted within the power section;

two longitudinally extending mounting flanges, each mounting flange having a U-shape, one side of ~~the each~~ mounting flange ~~U-shape~~ being coincident with a portion of one side of one of the upper wheel engaging section and the lower wheel engaging section; and another side of ~~the each~~ mounting flange ~~U-shape~~ being coincident with a portion of one side of the power section,

wherein the upper wheel engaging section and the lower wheel engaging section are spaced apart, the track has a closed side being closed by the power section and an open side opposite the power section, the open side being between the upper wheel engaging section and the lower wheel engaging section;

a plurality of interconnected cars, at least one car being a drive car, and at least one car being an article conveying car, the at least one drive car and the at least one article conveying car each have a brush assembly slidably engaging the power bus.

22. A sortation system comprising:

a longitudinally extending monorail track:

a plurality of interconnected cars, at least one car being a drive car, and at least one car being an article conveying car, each car ~~includes~~ including two wheel assemblies, each wheel assembly engaging the track, each wheel assembly comprising:

two vertically spaced apart side wheels, the side wheels rotating about a vertical axis; and

an end wheel, the end wheel rotating about a horizontal axis, the end wheel being a caster, the caster swiveling about a vertical axis.

23. The sortation system according to claim 22, wherein the end wheel of one wheel assembly is at an upper end of the wheel assembly and the end wheel of the other wheel assembly is at a lower end of the wheel assembly.

24. The sortation system according to claim 22, wherein the end wheel of each wheel assembly is at a lower end of the wheel assembly.

25. A track comprising:

a longitudinally extending monolithic monorail track having:

an upper wheel engaging section;

a lower wheel engaging section;

a power section, the upper wheel engaging section being connected to an upper portion of the power section and the lower wheel engaging section being connected to a lower portion of the power section; and

a multi-conductor power bus mounted within the power section,

wherein the upper wheel engaging section, the lower wheel engaging section and the power section each have a U-shape, wherein the upper wheel engaging section ~~U-shape~~ has its open side facing downward, the lower wheel engaging section ~~U-shape~~ has its open side facing upward, and the power section ~~U-shape~~ has its open side facing horizontally; and the upper wheel engaging section ~~U-shape~~ open side, the lower wheel engaging section ~~U-shape~~ open side and the power section ~~U-shape~~ open side all facing towards a common center.

26. The track according to claim 25, further comprising:

two mounting flanges, each mounting flange having ~~has~~ a U-shape, one side of the mounting flange ~~U-shape~~ being coincident with a portion of one side of one of the upper wheel engaging section and the lower wheel engaging section; and one side of the mounting flange ~~U-shape~~ being coincident with a portion of one side of the power section.

27. A drive car adapted for drivingly engaging a track comprising:
 - a frame;
 - a plurality of wheel assemblies attached to the frame; and
 - a motor and drive wheel assembly attached to the frame, the motor and drive wheel assembly being vertically movable relative to the frame, a drive wheel of the motor and drive wheel assembly being adapted to drivingly engage the track.
28. The drive car according to claim 27, wherein there are two wheel assemblies and the drive wheel is positioned between the wheel assemblies.
29. The drive car according to claim 27, wherein each wheel assembly comprises:
 - a plurality of spaced apart side wheels, the side wheels rotating about a vertical axis;
 - and an end wheel, the end wheel rotating about a horizontal axis.
30. The drive car according to claim 29, wherein the end wheel comprises a caster swiveling about a vertical axis.
31. The drive car according to claim 29, wherein there are two wheel assemblies, the drive car having a forward direction of travel, one wheel assembly having the end wheel at an upper end of the wheel assembly and being forward of the other wheel assembly, the end wheel of the other wheel assembly being at a lower end of the wheel assembly.
32. The drive car according to claim 27, wherein a rear end of the motor and drive wheel assembly is attached to the frame.

33. The drive car according to claim 32, further comprising a cantilever bar attached to the rear end of the motor and drive wheel assembly, a portion of the cantilever bar distal from the motor and drive wheel assembly being attached to the frame.

34. The drive car according to claim 32, further comprising a slide assembly mounted between the rear end of the motor and drive wheel assembly and the frame, the slide assembly comprising a slide slidably fitting within a slotted member, the slide assembly permitting the motor and drive wheel assembly to move vertically relative to the frame.

35. The drive car according to claim 27, wherein the motor and drive wheel assembly includes a right angle gear reducer between a motor of the motor and drive wheel assembly and the drive wheel.

36. The drive car according to claim 27, wherein ~~the~~a motor of the motor and drive wheel assembly is a position controllable drive motor.

37. The drive car according to claim 27, further comprising:
a wireless control signal receiver; and
a control signal transmission device adapted to transmit control signals to another drive car and to an article conveying car.

38. The drive car according to claim 37, further comprising:
a controller, the controller receiving control signals from the receiver, transmitting control signals to the motor and drive wheel assembly and transmitting control signals for at least one of another drive car and an article conveying car to the control signal transmission device.

39. The drive car according to claim 38, wherein the wireless control signal receiver, the control signal transmission device and the controller include a CAN[®] bus network.

40. The drive car according to claim 38, further comprising:
an interconnection adapted to connect a drive car to one of another drive car and an article conveying car, the interconnection including a mechanical connection and an electrical connection.
41. The drive car according to claim 39, wherein the electrical connection is electrically connected to the control signal transmission device.
42. A drive car adapted for drivingly engaging a track comprising:
a frame;
a two wheel assemblies attached to the frame, each wheel assembly comprising: a plurality of spaced apart side wheels, the side wheels rotating about a vertical axis; and an end caster wheel, the end caster wheel rotating about a horizontal axis, the drive car having a forward direction of travel, one wheel assembly having the end wheel at an upper end of the wheel assembly and being forward of the other wheel assembly, the end wheel of the other wheel assembly being at a lower end of the wheel assembly; and
a motor and drive wheel assembly attached to the frame, the motor and drive wheel assembly being vertically movable relative to the frame, a drive wheel of the motor and drive wheel assembly being adapted to drivingly engage the track, the motor and drive wheel assembly comprising: a cantilever bar attached to a rear part of the motor and drive wheel assembly, a portion of the cantilever bar distal from the motor and drive wheel assembly being attached to the frame; and a slide assembly mounted between the rear part of the motor and drive wheel assembly and the frame, the slide assembly comprising a slide slidably fitting within a slotted member, the slide assembly permitting the motor and drive wheel assembly to move vertically relative to the frame, the drive wheel being positioned between the wheel assemblies.
43. The drive car according to claim 42, further comprising:
a wireless control signal receiver; and

a control signal transmission device adapted to transmit control signals to another drive car and to an article conveying car.

44. An article conveying car adapted for movably engaging a track comprising:
a frame;
an endless movable belt;
at least three rotatable rollers attached to the frame, the movable belt being positioned about the rollers; and
at least one of the rollers being translatably moveable relative to the movable belt.
45. The article conveying car according to claim 44, further comprising an adjuster attached to each end of the translatably movable roller.
46. The article conveying car according to claim 45, wherein the adjuster includes a threaded apparatus attached to the translatably movable roller.
47. The article conveying car according to claim 44, wherein there are only three rotatable rollers, only one of the three rollers being translatably movable.
48. The article conveying car according to claim 44, wherein the at least three rollers are arranged in a triangle.
49. The article conveying car according to claim 44, wherein the movable belt is bi-directionally movable.
50. The article conveying car according to claim 44, further comprising a low friction plate attached to the frame and positioned below a portion of the belt.
51. The article conveying car according to claim 44, further comprising:

a belt alignment system comprising a first alignment member on the belt and a second alignment member on at least one of the frame and at least one roller, the first alignment member engaging the second alignment member.

52. The article conveying car according to claim 51, wherein the first alignment member comprises a rib on the underside of the belt and the second alignment member comprises a groove.

53. The article conveying car according to claim 52, wherein the second alignment member comprises a groove in the at least three rollers.

54. The article conveying car according to claim 52, wherein the frame includes a reduced friction plate below a portion of the belt and the second alignment member comprises a groove in the plate.

55. The article conveying car according to claim 44, further comprising:
a plurality of wheel assemblies attached to the frame, each wheel assembly adapted to engage the track, each wheel assembly comprising:
a plurality of spaced apart side wheels, the side wheels rotating about a vertical axis; and
at least one end wheel, the at least one end wheel rotating about a horizontal axis.

56. The article conveying car according to claim 55, wherein the at least one end wheel comprises a caster swiveling about a vertical axis.

57. The article conveying car according to claim 55, wherein the at least one end wheel is positioned at a lower end of the wheel assembly.

58. The article conveying car according to claim 44, further comprising a position controllable drive attached to the frame and operably connected to the belt.

59. The article conveying car according to claim 58, wherein the position controllable drive is bi-directional.

60. The article conveying car according to claim 58, wherein at least one roller is a drive roller and has a sprocket thereon, and the position controllable drive includes a timing belt engaging the sprocket.

61. The article conveying car according to claim 60, wherein the sprocket is integrally formed with the drive roller.

62. The article conveying car according to claim 44, further comprising:
an interconnection adapted to connect one article conveying car to one of a drive car and another article conveying car, the interconnection including a mechanical connection and an electrical connection.

63. The article conveying car according to claim 44, further comprising:
a plate extending away from the frame, the plate adapted to slidably fit beneath the belt on an adjacent article conveying car.

64. The article conveying car according to claim 63, wherein the plate has a rectangular shape.

65. An article conveying car comprising:
a frame comprising two side plates connected by a plurality of cross bars;
three rollers rotatably attached to the frame, the three rollers being arranged in a triangle;
an endless movable belt about the rollers;
two wheel assemblies attached to the ~~frame~~ side plates, each wheel assembly comprising: a plurality of spaced apart side wheels, the side wheels rotating about a vertical axis; and an end wheel caster at a lower end of the wheel assembly, a wheel of the end wheel caster rotating about a horizontal axis;

a bi-direction position controllable belt drive attached to the frame and operably connected to one of the rollers; and

an interconnection adapted to connect one article conveying car to one of a drive car and another article conveying car, the interconnection including a mechanical connection and an electrical connection.

66. The article conveying car according to claim 65, further comprising a car drive attached to the frame and adapted to drivingly engage a track.

67. The article conveying car according to claim 66, wherein the car drive is a linear induction drive.

68. An article conveying car comprising:

a frame comprising two side plates connected by a plurality of cross bars, and a reduced friction plate having a groove therein;

three rollers rotatably attached to the ~~frameside~~ side plates, the three rollers being arranged in a triangle, each roller having a groove therein;

an endless movable belt about the rollers, the belt having a rib extending therefrom, the belt rib tracking in at least one of the reduced friction plate groove and the roller grooves;

two wheel assemblies attached to the frame; and

a bi-direction position controllable belt drive attached to the frame and operably connected to one of the rollers.